

DETAILED ACTION

1. Claims 5-11 and 13-14 are pending in this office action and presented for examination. Claims 5, 8-11, and 13 are newly amended, claim 12 is newly cancelled, and claim 14 is newly added by amendment filed 5/23/2011.

2. Examiner notes that while the original claim 13 contained a period at the end of the claim, the amended claim 13 appears to remove this period without using an appropriate strikethrough.

While the examiner has nevertheless sent out an office action for the purposes of compact prosecution, applicant should be aware of these issues with corrections applied to future amendments if necessary.

Claim Objections

3. Claims 13-14 are objected to because of the following informalities. Appropriate correction is required.
4. Claim 13 does not end in a period.
- a. Claim 14 is objected to for failing to alleviate the objection of claim 13.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 5-11 and 13-14 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

7. Claim 5 recites the limitation "an interrupt, issued by a unit for requesting use of the reconfigurable unit" in line 7. However, the original disclosure does not appear to provide support for an interrupt issued by a unit for requesting use of the reconfigurable unit. For example, page 18, lines 29-30, of the amended specification dated 4/18/2007 (subject matter located in page 27, lines 24-27, of the originally filed specification) only discloses of "a resource which is to be enabled and/or switched for processing the interrupt." While this portion of the original disclosure may support the concept of a reconfigurable unit processing an interrupt, the portion does not support the concept of an interrupt which requests use of the reconfigurable unit. In other words, an interrupt which is processed by a reconfigurable unit is not necessarily the same as an interrupt which *requests* to be processed by the reconfigurable unit. While the recipient of an interrupt may determine that the interrupt should be processed by a reconfigurable unit, this does not mean that the sender of the interrupt requested that the interrupt be processed by the reconfigurable unit in particular. The remaining portions of the original disclosure likewise do not provide proper support for the aforementioned limitation.

b. Claims 6-7 and 13-14 are rejected for failing to alleviate the rejection of claim 5 above.

8. Claim 8 recites the limitation “an interrupt issued by a unit for requesting use of the reconfigurable unit” in lines 7-8. However, the original disclosure does not appear to provide support for an interrupt issued by a unit for requesting use of the reconfigurable unit. For example, page 18, lines 29-30, of the amended specification dated 4/18/2007 (subject matter located in page 27, lines 24-27, of the originally filed specification) only discloses of “a resource which is to be enabled and/or switched for processing the interrupt.” While this portion of the original disclosure may support the concept of a reconfigurable unit processing an interrupt, the portion does not support the concept of an interrupt which requests use of the reconfigurable unit. In other words, an interrupt which is processed by a reconfigurable unit is not necessarily the same as an interrupt which *requests* to be processed by the reconfigurable unit. While the recipient of an interrupt may determine that the interrupt should be processed by a reconfigurable unit, this does not mean that the sender of the interrupt requested that the interrupt be processed by the reconfigurable unit in particular. The remaining portions of the original disclosure likewise do not provide proper support for the aforementioned limitation.

9. Claim 9 recites the limitation “an interrupt issued by a unit for requesting use of the reconfigurable unit” in lines 5-6. However, the original disclosure does not appear to provide support for an interrupt issued by a unit for requesting use of the reconfigurable unit. For example, page 18, lines 29-30, of the amended specification dated 4/18/2007 (subject matter located in page 27, lines 24-27, of the originally filed specification) only

discloses of “a resource which is to be enabled and/or switched for processing the interrupt.” While this portion of the original disclosure may support the concept of a reconfigurable unit processing an interrupt, the portion does not support the concept of an interrupt which requests use of the reconfigurable unit. In other words, an interrupt which is processed by a reconfigurable unit is not necessarily the same as an interrupt which *requests* to be processed by the reconfigurable unit. While the recipient of an interrupt may determine that the interrupt should be processed by a reconfigurable unit, this does not mean that the sender of the interrupt requested that the interrupt be processed by the reconfigurable unit in particular. The remaining portions of the original disclosure likewise do not provide proper support for the aforementioned limitation.

10. Claim 10 recites the limitation “an interrupt, issued by a unit for requesting use of the reconfigurable unit” in line 14. However, the original disclosure does not appear to provide support for an interrupt issued by a unit for requesting use of the reconfigurable unit. For example, page 18, lines 29-30, of the amended specification dated 4/18/2007 (subject matter located in page 27, lines 24-27, of the originally filed specification) only discloses of “a resource which is to be enabled and/or switched for processing the interrupt.” While this portion of the original disclosure may support the concept of a reconfigurable unit processing an interrupt, the portion does not support the concept of an interrupt which requests use of the reconfigurable unit. In other words, an interrupt which is processed by a reconfigurable unit is not necessarily the same as an interrupt which *requests* to be processed by the reconfigurable unit. While the recipient of an

interrupt may determine that the interrupt should be processed by a reconfigurable unit, this does not mean that the sender of the interrupt requested that the interrupt be processed by the reconfigurable unit in particular. The remaining portions of the original disclosure likewise do not provide proper support for the aforementioned limitation.

11. Claim 11 recites the limitation "an interrupt issued by a unit for requesting use of the configurable cells" in lines 4-5. However, the original disclosure does not appear to provide support for an interrupt issued by a unit for requesting use of the configurable cells. For example, page 18, lines 29-30, of the amended specification dated 4/18/2007 (subject matter located in page 27, lines 24-27, of the originally filed specification) only discloses of "a resource which is to be enabled and/or switched for processing the interrupt." While this portion of the original disclosure may support the concept of configurable cells processing an interrupt, the portion does not support the concept of an interrupt which requests use of the configurable cells. In other words, an interrupt which is processed by configurable cells is not necessarily the same as an interrupt which *requests* to be processed by the configurable cells. While the recipient of an interrupt may determine that the interrupt should be processed by configurable cells, this does not mean that the sender of the interrupt requested that the interrupt be processed by the configurable cells in particular. The remaining portions of the original disclosure likewise do not provide proper support for the aforementioned limitation.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

13. Claims 8-9 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Allen et al. (Allen) (US 7000161).

14. Consider claim 8, Allen discloses processing, by a reconfigurable unit, in accordance with a configuration (col. 5, line 38, user application configuration; col. 4, lines 12-13, a programmable logic system including a programmable logic device) having a maximum allowed runtime (col. 5, line 37, watchdog timer; the watchdog timer holds the maximum allowed runtime); triggering an increase, by the configuration, of the configuration's maximum allowed runtime (col. 5, lines 37-39, the watchdog timer should run continually, and the user application configuration should repeatedly signal the watchdog timer; repeatedly signaling the watchdog timer resets the timer such that the configuration can continue to execute, as signaling the watchdog timer indicates that no error or failure of col. 5, lines 40-41 or hanging of col. 5, lines 27-28, occurs); and responsive to an interrupt issued by a unit for requesting use of the reconfigurable unit (col. 5, lines 28-29, the watchdog timer sets an exception state and initiates reconfiguration of the system; the exception state is the interrupt, the unit is the

watchdog timer; the reconfiguration of the system is the use of the reconfiguration unit), suppressing an increase by the configuration of the maximum allowed runtime (col. 5, lines 27-29, if it does not receive such a signal (e.g., because the system hangs), the watchdog timer sets an exception state and initiates reconfiguration of the system; in other words, once the watchdog timer sets an exception state and initiate reconfiguration of the system, the watchdog timer will no longer accept the signal which would cause an increase by the configuration of the maximum allowed runtime; note that suppress can be defined as "to restrain from a usual course or action") to respond to the interrupt upon expiry of the maximum allowed runtime (col. 5, lines 27-29, if it does not receive such a signal, the watchdog timer sets an exception state and initiates reconfiguration of the system; in other words, when the maximum allowed runtime has elapsed due to the watchdog timer not receiving a signal to reset the watchdog timer, the exception state is responded to by reconfiguring the system).

15. Consider claim 9, Allen discloses increasing, by a configuration (col. 5, line 38, user application configuration) having a maximum allowed runtime (col. 5, line 37, watchdog timer; the watchdog timer holds the maximum allowed runtime), the configuration's maximum allowed runtime (col. 5, lines 37-39, the watchdog timer should run continually, and the user application configuration should repeatedly signal the watchdog timer; repeatedly signaling the watchdog timer resets the timer such that the configuration can continue to execute, as signaling the watchdog timer indicates that no error or failure of col. 5, lines 40-41 or hanging of col. 5, lines 27-28, occurs); and

suppressing the increase (col. 5, lines 27-29, if it does not receive such a signal (e.g., because the system hangs), the watchdog timer sets an exception state and initiates reconfiguration of the system; in other words, once the watchdog timer sets an exception state and initiate reconfiguration of the system, the watchdog timer will no longer accept the signal which would cause an increase by the configuration of the maximum allowed runtime; note that suppress can be defined as "to restrain from a usual course or action") in response to the interrupt issued by a unit for requesting use of the reconfigurable unit (col. 5, lines 28-29, the watchdog timer sets an exception state and initiates reconfiguration of the system; the exception state is the interrupt, the unit is the watchdog timer; the reconfiguration of the system is the use of the reconfiguration unit); and reconfiguring the reconfigurable unit with a new reconfiguration for handling the interrupt responsive to expiry of the maximum allowed runtime (col. 5, lines 27-29, if it does not receive such a signal, the watchdog timer sets an exception state and initiates reconfiguration of the system; in other words, when the maximum allowed runtime has elapsed due to the watchdog timer not receiving a signal to reset the watchdog timer, the exception state is responded to by reconfiguring the system).

16. Consider claim 11, Allen discloses configurable cells configurable with a configuration (col. 5, line 38, user application configuration; col. 4, lines 12-13, a programmable logic system including a programmable logic device) having a maximum allowed runtime (col. 5, line 37, watchdog timer; the watchdog timer holds the maximum allowed runtime), wherein the configuration is adapted to trigger a counter reset to

increase its maximum allowed runtime (col. 5, lines 37-39, the watchdog timer should run continually, and the user application configuration should repeatedly signal the watchdog timer; repeatedly signaling the watchdog timer resets the timer such that the configuration can continue to execute, as signaling the watchdog timer indicates that no error or failure of col. 5, lines 40-41 or hanging of col. 5, lines 27-28, occurs) conditional at least upon that an interrupt issued by a unit for requesting use of the configurable cells (col. 5, lines 28-29, the watchdog timer sets an exception state and initiates reconfiguration of the system; the exception state is the interrupt, the unit is the watchdog timer; the reconfiguration of the system is the use of the reconfiguration unit) is not detected and processing is to continue without a thread switch and without a task switch (col. 5, lines 37-39, the watchdog timer should run continually, and the user application configuration should repeatedly signal the watchdog timer; repeatedly signaling the watchdog timer resets the timer such that no exception state is set and the configuration can continue to execute, as signaling the watchdog timer indicates that no error or failure of col. 5, lines 40-41 or hanging of col. 5, lines 27-28, occurs; thread switches and task switches do not occur in this context).

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. Claims 5, 10, and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. (Smith) (US 6658564) in view of Allen et al. (Allen) (US 7000161) in view of Borkenhagen et al. (Borkenhagen) (US 6076157).

19. Consider claim 5, Smith discloses processing in accordance with a first configuration (e.g. col. 11, lines 61-62, compiling hardware functions into configuration patterns; col. 2, lines 29-31 disclose of configuration data being used to execute an application).

However, Smith does not disclose of the first configuration having a maximum allowed runtime; increasing, by the first configuration, the first configuration's maximum allowed runtime; if an interrupt, issued by a unit for requesting use of the reconfigurable unit, occurs, suppressing the increase in response to the interrupt; and if no interrupt occurs, reconfiguring the reconfigurable unit with a second configuration in response to expiry of the increased maximum allowed runtime, the increased maximum allowed runtime expiring due to suppression by at least one of a task switch and a thread switch of a further increase of the maximum allowed runtime.

On the other hand, Allen discloses of a first configuration (col. 5, line 38, user application configuration) having a maximum allowed runtime (col. 5, line 37, watchdog timer; the watchdog timer holds the maximum allowed runtime); increasing, by the first configuration, the first configuration's maximum allowed runtime (col. 5, lines 37-39, the watchdog timer should run continually, and the user application configuration should repeatedly signal the watchdog timer; repeatedly signaling the watchdog timer resets the timer such that the configuration can continue to execute, as signaling the watchdog

timer indicates that no error or failure of col. 5, lines 40-41 or hanging of col. 5, lines 27-28, occurs); if an interrupt occurs, issued by a unit for requesting use of the reconfigurable unit, occurs (col. 5, lines 28-29, the watchdog timer sets an exception state and initiates reconfiguration of the system; the exception state is the interrupt, the unit is the watchdog timer; the reconfiguration of the system is the use of the reconfiguration unit), suppressing the increase in response to the interrupt (col. 5, lines 27-29, if it does not receive such a signal (e.g., because the system hangs), the watchdog timer sets an exception state and initiates reconfiguration of the system; in other words, once the watchdog timer sets an exception state and initiate reconfiguration of the system, the watchdog timer will no longer accept the signal which would cause an increase by the configuration of the maximum allowed runtime; note that suppress can be defined as "to restrain from a usual course or action"); and reconfiguring the reconfigurable unit with a second configuration in response to expiry of the increased maximum allowed runtime (col. 5, lines 27-29, if it does not receive such a signal e.g. because the system hangs, the watchdog timer sets an exception state and initiates reconfiguration of the system), the increased maximum allowed runtime expiring due to suppression by an error, failure, or hanging of a further increase of the maximum allowed runtime (error or failure of col. 5, lines 40-41 or hanging of col. 5, lines 27-28 prevents the watchdog timer from being signaled, as described in col. 5, lines 27-29, if it does not receive such a signal (e.g. because the system hangs), the watchdog timer sets an exception state and initiates reconfiguration of the system).

Allen's teaching detects errors, failures, and hanging (Allen, col. 5, lines 40-41 and col. 5, lines 27-28).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teaching of Allen with the invention of Smith in order to detect errors, failures, and hanging.

However, Smith and Allen do not disclose of at least one of a task switch and a thread switch in particular, and not an interrupt, suppressing a further increase of the maximum allowed runtime.

On the other hand, Borkenhagen discloses of at least one of a task switch and a thread switch, and not an interrupt, prohibiting further execution of a thread (col. 15, lines 36-42, forcing a thread switch).

Borkenhagen's teaching prevents system hangs due to shared resource, contention, enforces fairness of processor cycle allocation between threads, and limits the maximum response latency to external interrupt and other events external to the processor (Borkenhagen, col. 15, lines 36-42).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teaching of Borkenhagen with the invention of Smith and Allen in order to prevents system hangs due to shared resource, contention, enforces fairness of processor cycle allocation between threads, and limits the maximum response latency to external interrupt and other events external to the processor. Note that Borkenhagen's teaching of at least one of a task switch and a thread switch prohibiting further execution of a thread, when applied to the combination

of Smith and Allen wherein further execution of a configuration is prohibited in response to expiry of the increased maximum allowed runtime due to suppression of a further increase of the maximum allowed runtime, teach the overall limitation of at least one of a task switch and a thread switch suppressing a further increase of the maximum allowed runtime.

20. Consider claim 10, Smith discloses processing in accordance with a first configuration (e.g. col. 11, lines 61-62, compiling hardware functions into configuration patterns; col. 2, lines 29-31 disclose of configuration data being used to execute an application).

However, Smith does not disclose of the first configuration having a maximum allowed runtime; and if an interrupt does not occur: the first configuration triggering a counter reset, the counter reset increasing the maximum allowed runtime; subsequent to the counter reset, and for a scheduled task switch, the counter counting to the increased maximum allowed runtime without a retriggering of the counter by the first configuration; and responsive to the reaching of the increased maximum allowed runtime, performing one of a task switch and a thread switch by reconfiguring the reconfigurable unit with a second configuration; wherein, if an interrupt, issued by a unit for requesting use of the reconfigurable unit, does occur, responsive to the occurrence of the interrupt, the maximum allowed runtime is not increased.

On the other hand, Allen discloses of a first configuration (col. 5, line 38, user application configuration) having a maximum allowed runtime (col. 5, line 37, watchdog

timer; the watchdog timer holds the maximum allowed runtime); the first configuration triggering a counter reset (col. 5, lines 37-39, the watchdog timer should run continually, and the user application configuration should repeatedly signal the watchdog timer; repeatedly signaling the watchdog timer resets the timer such that the configuration can continue to execute, as signaling the watchdog timer indicates that no error or failure of col. 5, lines 40-41 or hanging of col. 5, lines 27-28, occurs), the counter reset increasing the maximum allowed runtime (col. 5, line 37, watchdog timer; the watchdog timer holds the maximum allowed runtime); subsequent to the counter reset, the counter counting to the increased maximum allowed runtime without a retriggering of the counter by the first configuration (col. 5, line 40-42, for example, a later-occurring error or failure that is not detected by the configuration itself can be detected by the watchdog timer; the error or failure interrupts the execution of the configuration; in response to this interrupt, no signalling occurs, and the increase in maximum allowed runtime is suppressed); and responsive to the reaching of the increased maximum allowed runtime, reconfiguring the reconfigurable unit with a second configuration (col. 5, lines 27-29, if it does not receive such a signal (e.g. because the system hangs), the watchdog timer sets an exception state and initiates reconfiguration of the system); wherein, if an interrupt, issued by a unit for requesting use of the reconfigurable unit, does occur (col. 5, lines 28-29, the watchdog timer sets an exception state and initiates reconfiguration of the system; the exception state is the interrupt, the unit is the watchdog timer; the reconfiguration of the system is the use of the reconfiguration unit), responsive to the occurrence of the interrupt, the maximum allowed runtime is not increased (col. 5, lines

27-29, if it does not receive such a signal (e.g., because the system hangs), the watchdog timer sets an exception state and initiates reconfiguration of the system; in other words, once the watchdog timer sets an exception state and initiate reconfiguration of the system, the watchdog timer will no longer accept the signal which would cause an increase by the configuration of the maximum allowed runtime).

Allen's teaching detects errors, failures, and hanging (Allen, col. 5, lines 40-41 and col. 5, lines 27-28).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teaching of Allen with the invention of Smith in order to detect errors, failures, and hanging.

However, Smith and Allen do not disclose that for a scheduled task switch, and not an interrupt, the counter counting to the increased maximum allowed runtime without a retriggering of the counter by the first configuration, and that at least one of a task switch and a thread switch in particular, and not an interrupt, is performed by reconfiguring the reconfigurable unit with a second configuration.

On the other hand, Borkenhagen discloses of at least one of a task switch and a thread switch, and not an interrupt, prohibiting further execution of a thread (col. 15, lines 36-42, forcing a thread switch).

Borkenhagen's teaching prevents system hangs due to shared resource, contention, enforces fairness of processor cycle allocation between threads, and limits the maximum response latency to external interrupt and other events external to the processor (Borkenhagen, col. 15, lines 36-42).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teaching of Borkenhagen with the invention of Smith and Allen in order to prevent system hangs due to shared resource contention, enforces fairness of processor cycle allocation between threads, and limits the maximum response latency to external interrupt and other events external to the processor. Note that Borkenhagen's teaching of at least one of a task switch and a thread switch prohibiting further execution of a thread, when applied to the combination of Smith and Allen wherein further execution of a configuration is prohibited in response to expiry of the increased maximum allowed runtime due to suppression of a further increase of the maximum allowed runtime, teach the overall limitation that for a scheduled task switch, the counter counting to the increased maximum allowed runtime without a retriggering of the counter by the first configuration, and that at least one of a task switch and a thread, is performed by reconfiguring the reconfigurable unit with a second configuration.

21. Consider claim 13, Smith discloses a plurality of program instructions are executable via a single instance of the first configuration (col. 13, lines 33-34, a single block of configuration data that makes up a given function; col. 1, lines 21-23, discloses that software-implemented functions must be fairly complex to accommodate the microprocessor's generic instruction set; in other words, functions are comprised of a plurality of instructions of the microprocessor's generic instruction set. Alternatively, see col. 2, lines 26-29, which discloses software functions are compiled into threads; note

that a thread is also readily recognized to one of ordinary skill in the art to comprise multiple instructions).

22. Consider claim 14, Smith discloses the single instance of the first configuration defines only a single function for each of at least a subset of cells of the reconfigurable unit and not more than one function for any cells of the reconfigurable unit (col. 13, lines 32-34, allocating a single one of the programmable logic resources to a single block of configuration data that makes up a given function; in other words, the single block of configuration data which corresponds to a single one of the programmable logic resources defines a given function for a subset of cells which correlate to the block of configuration data of the reconfigurable unit, and not multiple functions).

23. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smith, Allen, and Borkenhagen as applied to claim 5 above, and further in view of Parhami (Parallel Counters for Signed Binary Signals).

24. Consider claim 6, Smith, Allen, and Borkenhagen do not disclose that the first configuration triggers a parallel counter to perform the increasing.

On the other hand, Parhami discloses of a parallel counter (section 1, second paragraph, first line, parallel counter).

Parhami's teaching of a parallel counter achieves higher speeds than regular counters (section 1, first paragraph, last two lines).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teaching of Parhami with the invention of Smith, Allen, and Borkenhagen, in order to achieve higher speeds.

25. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smith, Allen, and Borkenhagen as applied to claim 5 above, and further in view of Rubinstein et al. (Rubinstein) (US 4959781).

26. Consider claim 7, Smith discloses of an interrupt whose processing requires handling within the maximum allowed runtime (col. 8, lines 14-15, detecting a high priority function such as a real-time interrupt handling process).

However, Smith, Allen, and Borkenhagen do not disclose that the interrupt whose processing requires handling within the maximum allowed runtime is handled on a component reserved for handling of interrupts whose processing requires handling within the maximum allowed runtime and on which the first configuration is not run.

On the other hand, Rubinstein discloses of handling interrupts on a component reserved for handling of interrupts on which the configuration is not run (col. 1, lines 24-29, all interrupts from a particular class are assigned to and handled by a particular processor; classes may all be assigned to a single processor).

Rubinstein's teaching minimizes impact on other system processing (Rubinstein, col. 1, lines 42-44).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teaching of Rubinstein with the invention of Smith, Allen, and Borkenhagen in order to minimize impact on other system processing.

Response to Arguments

27. Applicant on page 5 argues that "an interrupt is understood by one of ordinary skill in the art as a signal informing of an occurrence of an event," whereas the basis of the rejection of claims 8, 9, and 11 is an overly broad interpretation of the term "interrupt," to mean any interrupt in the running of a unit.

However, the previous rejection of claims 8, 9 and 11 cited an error or failure as interrupting the execution of the configuration by preventing the configuration from sending a signal to reset the watchdog timer. While the interrupt limitation (as meaning an interrupt in the running of a unit, which is a broad but reasonable interpretation) is taught in Allen by an error or failure interrupting the running of the configuration, the interrupt limitation (as specifically interpreted by applicant to mean "a signal informing of an occurrence of an event") is also taught in Allen. Allen, col. 9, lines 34-35, discloses that [watchdog] timer 46 is reset by signal RU_nRSTIMER being asserted low. In other words, the signal RU_nRSTIMER being high, at the time of expiration of the watchdog timer, informs the watchdog timer of an occurrence of an error or failure in the execution of the configuration.

Applicant then notes that each of the claims has been amended to clarify that the interrupt is issued by a unit for requesting use of a reconfigurable unit, and that the

mere occurrence in the Allen reference of an error which passively results in failure of a user application configuration to signal its successful loading is unrelated to an interrupt as required by each of claims 8, 9, and 11.

Examiner first notes that the amended limitations appear to catalyze a written description issue. Specifically, the original disclosure does not appear to provide support for an interrupt issued by a unit for requesting use of the reconfigurable unit. For example, page 18, lines 29-30, of the amended specification dated 4/18/2007 (subject matter located in page 27, lines 24-27, of the originally filed specification) only discloses of "a resource which is to be enabled and/or switched for processing the interrupt." While this portion of the original disclosure may support the concept of a reconfigurable unit processing an interrupt, the portion does not support the concept of an interrupt which requests use of the reconfigurable unit. In other words, an interrupt which is processed by a reconfigurable unit is not necessarily the same as an interrupt which *requests* to be processed by the reconfigurable unit. While the recipient of an interrupt may determine that the interrupt should be processed by a reconfigurable unit, this does not mean that the sender of the interrupt requested that the interrupt be processed by the reconfigurable unit in particular. The remaining portions of the original disclosure likewise do not provide proper support for the aforementioned limitation.

Examiner further notes that Allen still teaches the amended claim limitations, though with different citation correlations. Specifically, Allen discloses an interrupt issued by a unit for requesting use of the reconfigurable unit (col. 5, lines 28-29, the watchdog timer sets an exception state and initiates reconfiguration of the system; the

exception state is the interrupt, the unit is the watchdog timer; the reconfiguration of the system is the use of the reconfiguration unit).

28. Applicant on page 6 argues that the Allen reference is therefore unrelated to the features concerning the handling of an interrupt recited in claims 5 and 10 for at least essentially the same reasons set forth above in support of the patentability of claims 8, 9, and 11.

Consequently, examiner's response to arguments with regard to claims 8, 9 and 11 are also applicable to the arguments of claims 5 and 10.

29. Applicant on page 6 argues that Smith's disclosure that a single programmable logic resource may be allocated to a single block of configuration data that makes up a given function does not in any way indicate that more than one instruction is executable by the single block of configuration data.

Although examiner believes that it would have been readily recognized to one of ordinary skill in the art at the time of the invention that a "function" both in the general computer programming field and in the context of the Smith reference is comprised of more than one instruction, examiner has now provided explicit citations from the Smith reference to support this interpretation. Specifically, Smith, col. 1, lines 21-23, discloses that software-implemented functions must be fairly complex to accommodate the microprocessor's generic instruction set; in other words, functions are comprised of a plurality of instructions of the microprocessor's generic instruction set. Alternatively, see

col. 2, lines 26-29, of Smith which discloses software functions are compiled into threads; note that a thread is also readily recognized by one of ordinary skill in the art to comprise multiple instructions.

30. Applicant on page 7 argues that claim 6 depends from claim 5 and is therefore allowable for at least the same reasons as claim 5.

Consequently, examiner's response to arguments with regard to claim 5 is also applicable to the argument of claim 6.

31. Applicant on page 7 argues that claim 7 depends from claim 5 and is therefore allowable for at least the same reasons as claim 5.

Consequently, examiner's response to arguments with regard to claim 5 is also applicable to the argument of claim 7.

32. Applicant on page 7 argues that claim 14 depends from claim 13 and is therefore allowable for at least the same reasons as claim 13.

Consequently, examiner's response to arguments with regard to claim 13 is also applicable to the argument of claim 14.

Conclusion

33. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

34. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEITH VICARY whose telephone number is (571)270-1314. The examiner can normally be reached on Monday - Thursday, 7:00 a.m. - 5:30 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on 571-272-4162. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Keith Vicary/
Primary Examiner, Art Unit 2183